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Constraining the ^{30}P(p,γ)^{31}S reaction using ^{30}P(d,pγ)^{31}P with GODDESS[1] RAJESH GHIMIRE, University of Tennessee + Oak Ridge National Laboratory, STEVEN PAIN, Oak Ridge National Laboratory, KATE JONES, JOSHUA HOOKER, University of Tennessee, ANDREW RATKIEWICZ, Lawrence Livermore National Laboratory, JOLIE CIZEWSKI, HARRISON SIMS, GWENAELLE SEYMOUR, CHAD UMMEL, Rutgers University, GEMMA WILSON, Argonne National Laboratory, GODDESS COLLABORATION — The ^{30}P(p,γ)^{31}S reaction rate critically affects the mass flow into the A=30-40 range, impacting abundances of isotopes of P, S and Si during classical nova nucleosynthesis. This reaction rate depends on undetermined spectroscopic strengths of low-lying resonances in ^{31}S, lying between 6 and 7 MeV in excitation. But, direct measurement of (p,γ) reaction is not possible due to low intensities of currently available ^{30}P beam and proton spectroscopic factors on unstable nuclei are difficult to measure experimentally. We performed a ^{30}P(d,pγ)^{31}P reaction measurement using the newly commissioned GODDESS (Gretina-ORRUBA: Dual Detectors for Experimental Structure Studies) system-with an 8 MeV/u ^{30}P beam, from RAISOR at ATLAS, to provide constraints on the proton spectroscopic strengths for ^{31}S levels via mirror symmetry. Experimental details and data analysis status will be presented.

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